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THE VEGETATION OF KUDIRAIMOLI TERI, TIRUNELVELI DISTRICT, MADRAS STATE

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ABSTRACT

A detailed floristic and ecological study of Kudiraimoli Teri has been made during 1961-62. The whole range of forest is divided into South West and North East zones. The vegetation of North East zone is formed by pure formation of *Borassus flabellifer* and that of the South West zone is formed by the scrub jungle type.

The vegetative analysis of the scrub vegetation has been made by quadrat study. The quantitative analytic characters of the species of the type have been worked out.

Among the 105 species distributed under 45 families studied from this region, the family Leguminosae forms the physiognomic family dominance.

INTRODUCTION

The vegetation of Kudiraimoli Teri Reserve Forest has not been studied in detail by previous workers. Sankaranarayanan (1959) mentioned its structure and composition while dealing the vegetation of Tirunelveli District. The present paper deals with a detailed ecological account of the vegetation of Kudiraimoli Teri.

The area is situated in Tiruchendur Taluk, Tirunelveli District, Madras State at an altitude of ±30 M. The whole range of forests lies between 8°29'N and 8°34'N latitudes and 77°58'E and 78°3' E longitudes. It is a psammophytic area covering 51.80 sq. km. with numerous sand dunes. The natural spring inside the Teri is like an oasis where some Hydrophytic and Helophytic vegetation are found.

A systematic survey of the area have been made during the years 1961-62 in different seasons by the author. All the species enumerated below are collected by the author and they are kept in the Regional Herbarium of the Southern Circle, Botanical Survey of India, Coimbatore. For each species the following data are given—lifefrom, flowering and fruiting stage with date of collection and field number.

METHODS

The whole range of Forest is divided into South West and North East zones after getting a general idea of the distribution of plant communities by reconnaisance and primary survey. They were fixed for detailed studies.

The vegetation of North East zone is formed by pure formation of *Borassus flabellifer* and that of the South West zone is formed by the scrub jungle.

The vegetative analysis of the scrub formation has been carried out by 20 meter quadrat. The sampling have been made following the multiple plot method (Cain and Castro) in which the quadrats were made in a checkerboard pattern to cover the scrub vegetation. The type of vegetation were determined and the quantitative analytic characters of the species of the type have been worked out.

The method followed was essentially the same as propounded by Braun-Blanquet (1932) with slight modifications in scale. The + sign has been introduced for dominance and density which indicates that the number of individuals and the area covered are both very small.

The quantitative analytic characters of each species were worked out by the following calculations.

Density: The number of individuals of a species on a unit area.

Dominance : It is estimated and expressed as follows:

+ — species covering below 1% of the surface.
a — species covering 1-5% of the surface
b — species covering 6-25% of the surface
c — species covering 26-50% of the surface
d — species covering 51-75% of the surface
e — species covering 76-100% of the surface

Frequency: The percentage occurrence of a species in the units was calculated in the usual manner and the frequency class was expressed as follows:

a — species in 1-20% of the sample unit
b — species in 21-40% of the sample unit
c — species in 21-60% of the sample unit
d — species in 61-80% of the sample unit
e — species in 81-100% of the sample unit

ENVIRONMENT

The average reading of the meteorological data gathered from the nearest (Palayamkottai) Meterological Station explains the climatic conditions of the region described. The records of the rainfall, temperature, humidity and wind velocity are given in the table.

TABLE

Particulars		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Rainfall (in cm.)	...	3.3	1.6	1.8	7.9	5.4	0.8	0.3	3.2	1.4	1.5	16.0	7.0
Temperature (in °C)	...	26	28	30	31	30	30	30	30	31•	29	27	26
Humidity (in %)	...	67	63	59	60	56	55	54	54	53	64	75	69
Wind speed (Km. P. H.)	...	9.5	8.4	8.5	7.1	10.5	13.2	18.9	17.4	12.8	9.1	7.3	9.5

Rainfall: The area under study is benefitted by the South West and North East monsoons. The maximum rainfall is in Retreating Monsoon of the South West monsoon.

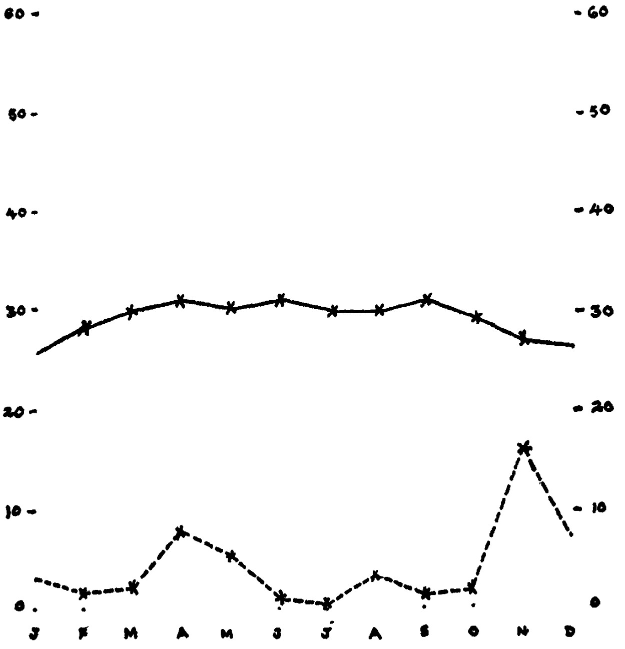
Temperature: The temperature is more or less uniform throughout the year and it varies from 26°C to 31°C.

Humidity: The mean monthly Humidity is given in the table. The lowest humidity is in the month of September and the highest in November.

Wind: The wind velocity varies from 7.3 km. P. H. to 18.9 km. P. H. During July and August the wind velocity is more. According to Beaufort Scale of wind force, the general description is moderate or gentle breeze almost in all months except in August and September when there is strong breeze.

Hydrotherm figure shows the interrelationship and annual course of the temperature and precipitate on which the relation between the favourable and unfavourable season depends. This figure becomes the chief expression of the physical condition of vegetation. By combining the above data of the normals of rainfall and temperature of Kudiraimoli Teri, the hydrotherm figure is obtained (fig. 1). In the figure 2 the normals of rainfall and relative humidity are plotted.

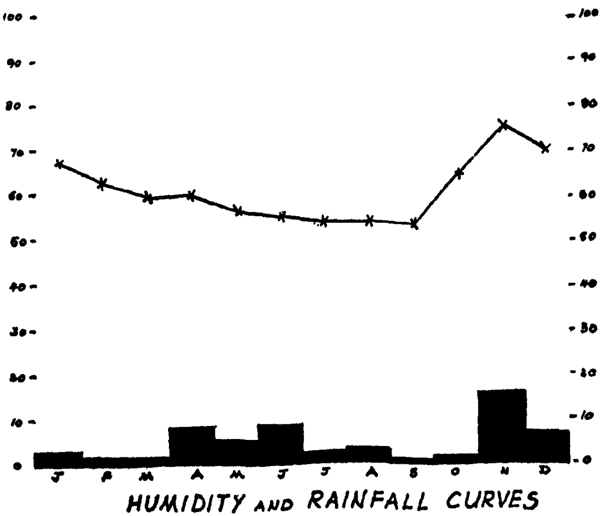
The forest comes under Dry Deciduous (Thorny) Semi-evergreen type. The soils of the area is peculiar in that it consists of large blocks of extensive dunes of loose shifting red sand. Locally such dunes are called 'Teri'. The edaphic condition is the limiting factor for the formation of plant communities. Hydrophytic and Helophytic vegetation are found in the natural spring where the soil is very wet.



HYDROTHERM FIGURE

TEMPARATURE ——

RAINFALL. ------



HUMIDITY AND RAINFALL CURVES

HUMIDITY —— RAINFALL ■

STRUCTURE OF PLANT COMMUNITY QUADRAT DATA

Scrub vegetation

No. of quadrats studied : 5 (20 sq. m.)

Name	Individual plants 1	2	3	4	5	Total individuals
Dalbergia spinosa Roxb. (337)	4	15	45	55	31	150
Dodonaea viscosa Linn. (360)	4	3	2	23	71	103
Securinega leucopyrus (Willd.) Muell.-Arg. (319)	38	22	2	—	—	62
Xeromphis spinosa (Thunb.) Keay (314)	2	4	6	1	1	14
Acacia planifrons W. & A. (378)	6	5	—	1	—	12
Azadirachta indica A. Juss. (387)	8	1	2	—	—	6
Flacourtia indica (Burm. f.) Merr. (408)	2	—	4	—	—	6
Zizyphus xylopyrus Willd. (327)	1	2	1	1	—	5
Dichrostachys santapaui Sebastine et Ramam. (340)	2	1	2	—	—	5
Borassus flabellifer Linn. (413)	1	—	2	1	—	4
Cassia auriculata Linn. (316)	—	2	—	—	2	4
Calotropis gigantea R. Br. (359)	—	—	1	—	2	3
Canthium parviflorum Lamk. (336)	—	—	—	2	1	3
Morinda tinctoria Roxb. (328)	1	—	1	—	—	2
Gmelina asiatica Linn. (315)	—	1	—	—	1	2
Cordia dichotoma Forst. f. (361)	1	—	—	—	—	1
Zizyphus mauritiana Lamk. var. *fruticosa* Seb. et Bal. (388)	1	—	—	—	—	1
Pongamia pinnata (Linn.) Pierre (362)	—	—	—	1	—	1

PHYTOSOCIOLOGICAL DATA

No. of plots studied : 5
Area of each plot : 20 sq. meter
(Sampling unit)

Community type : *Dalbergia-Dodonaea*

	Dalbergia spinosa Roxb. (337)	*Dodonaea viscosa* Linn. (360)	*Securinega leucopyrus* (Willd.) Muell.-Arg. (319)	*Xeromphis spinosa* (Thunb.) Keay (314)	*Acacia planifrons* W. & A. (378)	*Azadirachta indica* A. Juss. (387)	*Flacourtia indica* (Burm. f.) Merr. (408)	*Zizyphus xylopyrus* Willd. (327)	*Dichrostachys santapaui* Sebastine et Ramam. (340)	*Borassus flabellifer* Linn. (413)	*Cassia auriculata* Linn. (316)	*Calotropis gigantea* R. Br. (359)	*Canthium parviflorum* Lamk. (336)	*Morinda tinctoria* Roxb. (328)	*Gmelina asiatica* Linn. (315)	*Cordia dichotoma* Forst. f. (361)	*Zizyphus mauritiana* Lamk. var. *fruticosa* Seb. et Bal. (388)	*Pongamia pinnata* (Linn) Pierre (362)
Density	30	21	12	3	2	1	1	1	1	1	1	1	1	1	1	+	+	+
Dominance	c	c	b	a	a	a	a	a	a	a	a	a	a	a	a	+	+	+
Frequency	e	e	c	e	c	c	b	d	c	c	b	b	b	b	b	a	a	a

DISCUSSION

As the result of systematic ecological survey, 10 species of trees, 23 species of shrubs, 10 species of undershrubs, 47 species of herbs, 14 species of marshy and aquatic plants and 1 parasite have been examined. Among the 105 species distributed under 45 families studied from this region, the family Leguminosae forms the physiognomic family dominance.

The vegetation of the North East zone is absolutely sparse. The most conspicuous tree is *Borassus flabellifer* which forms the only pure formation. *Anacardium occidentale* (introduced) with rounded crowns and stems and branches are sunk partially amidst the red sand dunes. Shrubs like *Calotropis gigantea* and *Dodonea viscosa* are found abundantly growing as undershrubs. Colonies of *Cyperus arenarius* noted here and there form an effective soil binder. The ground floor vegetation like *Mollugo disticha, Mollugo cerviana, Cleome tenella, Mollugo pentaphylla, Evolvulus alsinoides* and *Zornia zeylonensis* are distributed sparsely.

The vegetation of South West zone is chararterised by *Dalbergia-Dodonea* type. *Dalbergia spinosa* and *Dodonaea viscosa* being the characteristic species, form the dominant and co-dominant species of the type. *Securinega leucopyrus* is the companion species. *Xeromphis spinosa, Acacia planifrons, Azadirachta indica, Flacourtia indica, Zizyphus xylopyrus, Dichrostachys santapaui, Calotropis gigantea, Canthium parviflorum, Morinda tinctoria, mauritiana* and *Pongamia pinnata* are the accidentals.

ENUMERATION

MENISPERMACEAE

Cocculus hirsutus (Linn.) Diels—Nanophanerophyte, in flower 16-11-61, 404.

NYMPHAEACEAE

Nymphaea pubescens Willd.—Hydrophyte, in flower 31-10-61, 372.

CAPPARIDACEAE

Cleome tenella Linn. f.—Therophyte, in flower and fruit 29-10-61, 326.

VIOLACEAE

Hybanthes enneaspermus (Linn.) F.v. Muell. (=*Ionidium suffruticosum* Ging.)—Chamaephyte, in flower and fruit 28-10-61, 311.

FLACOURTIACEAE

Flacourtia indica (Burm. f.) Merrill (=*Flacourtia sepiaria* Roxb.)—Nanophanerophyte, in flower 27-11-61, 408.

POLYGALACEAE

Polygala javana DC.—Chamaephyte, in flower 1-11-61, 384.

CARYOPHYLLACEAE

Polycarpaea diffusa W. & A.—Chamaephyte, in flower 28-10-61, 313.

PORTULACACEAE

Portulaca quadrifida Linn.—Therophyte, in flower 2-11-61, 394.

MALVACEAE

Hibiscus micranthus Linn. f.—Chamaephyte, in flower and fruit 1-11-61, 389.

Pavonia zeylanica (Linn.) Cav.—Chamaephyte, in flower and fruit 30-10-61, 347.

Sida veronicaefolia Linn.—Therophyte, in flower 27-11-61, 406.

STERCULIACEAE

Waltheria indica Linn.—Chamaephyte, in flower 29-10-61, 329.

TILIACEAE

Corchorus tridens Linn.—Therophyte, in flower and fruit 30-10-61, 346.

Grewia betulaefolia Juss.—Nanophanerophyte, in flower 26-11-61, 403.

Triumfeta rotundifolia Lam.—Therophyte, in flower 27-11-61, 405.

ZYGOPHYLLACEAE

Tribulus terrestris Linn.—Chamaephyte, in flower and fruit 1-11-61, 387.

MELIACEAE

Azadirachta indica A. Juss.—Microphanerophyte, in flower and fruit 1-11-61, 387.

RHAMNACEAE

Zizyphus mauritiana var. **fruticosa** (Haines) Seb. et Bal. (=*Z. jujuba* var. *fruticosa* Haines)—Microphanerophyte, in flower 1-11-61, 388.

Z. xylopyrus Willd.—Microphanerophyte, in flower 29-10-61, 327.

VITACEAE

Cissus quadrangularis Linn.—Nanophanerophyte, in flower 29-10-61, 323.

C. setosa Roxb.—Chamaephyte, in flower 2-11-61, 393.

SAPINDACEAE

Dodonaea viscosa Linn.—Nanophanerophyte, in flower 1-11-61, 360.

ANACARDIACEAE

Anacardium occidentale Linn.—Microphanerophyte, in flower 30-10-61, 360.

PAPILIONACEAE

Abrus precatorius Linn.—Nanophanerophyte, in flower and fruit 31-10-61, 371.

Alysicarpus monilifer DC.—Chamaephyte, in flower and fruit 30-10-61, 351.

Canavalia virosa W. & A. var. **mollis** Gamb.—Chamaephyte, in flower and fruit 2-11-61, 392.

Crotalaria laburnifolia Linn.—Nanophanerophyte, in flower and fruit 31-10-61, 365.

C. verrucosa Linn.—Chamaephyte, in flower and fruit 26-11-61, 402.

Dalbergia spinosa Roxb.—Microphanerophyte, in flower 29-10-61, 337.

Galactia tenuiflora W. & A.—Chamaephyte, in flower and fruit 26-11-61, 398.

Indigofera aspalathoides Vahl—Nanophanerophyte, in flower and fruit 28-10-61, 309.

Pongamia pinnata (Linn.) Pierre—Microphanerophyte, in flower 31-10-61, 362.

Rothia trifoliata Pers.—Therophyte, in flower and fruit 1-12-61, 412.

Tephrosia purpurea Pers.—Nanophanerophyte, in flower and fruit 29-10-61, 324.

Zornia zeylonensis Pers.—Chamaephyte, in flower and fruit 30-10-61, 357.

CAESALPINIACEAE

Cassia auriculata Linn.—Nanophanerophyte, in flower and fruit 28-10-61, 316.

C. nigricans Vahl—Nanophanerophyte, in flower and fruit 31-10-61, 368.

C. obtusa Roxb.—Chamaephyte, in flower and fruit 1-11-61, 381.

C. senna Linn. (*C. angustifolia* Vahl)—Nanophanerophyte, in flower and fruit 29-10-61, 331.

MIMOSACEAE

Acacia planifrons W. & A.—Microphanerophyte, in flower 1-11-61, 378.

Dichrostachys santapaui Sebastine et Rāmam.—Microphanerophyte, in flower 29-10-61, 340.

LYTHRACEAE

Ammannia baccifera Linn.—Helophyte, in flower 30-10-61, 355.

ONAGRACEAE

Jussiaea suffruticosa Linn.—Hydrophyte, in flower and fruit 26-11-61, 399.

CUCURBITACEAE

Coccinia cordifolia (Linn.) Cogn. (=*C. indica* W. & A.)—Geophyte, in flower 29-10-61, 334.

MOLLUGINACEAE

Gisekia pharnaceoides Linn.—Therophyte, in flower 30-10-61, 348.

Mollugo cerviana Ser.—Therophyte, in flower and fruit 30-10-61, 345.

M. disticha Ser.—Therophyte, in flower and fruit 29-10-61, 321.

M. pentaphylla Linn.—Chamaephyte, in flower and fruit 1-11-61, 390.

RUBIACEAE

Borreria hispida (Linn.) Schum.—Chamaephyte, in flower and fruit 30-10-61, 349.

Canthium parviflorum Lamk. (=*Plectronia parviflora* Bedd.)—Nanophanerophyte, in flower 29-10-61, 336.

Dentella repens Forst.—Helophyte, in flower 31-10-61, 366.

Morinda tinctoria Roxb.—Microphanerophyte, in flower 29-10-61, 328.

Oldenlandia diffusa Roxb.—Therophyte, in flower 31-10-61, 375.

O. stricta Linn.—Chamaephyte, in flower 30-10-61, 356.

Xeromphis spinosa (Thunb.) Keay (=*Randia dumetorum* Poir.)—Nanophanerophyte, in flower 28-10-61, 314.

COMPOSITAE

Eclipta prostrata (Linn.) Linn. (=*E. alba* Hassk.)—Therophyte, in flower 30-10-61, 352.

APOCYNACEAE

Carissa spinarum Linn.—Nanophanerophyte, in flower 29-10-61, 320.

ASCLEPIADACEAE

Calotropis gigantea R. Br.—Nanophanerophyte, in flower 30-10-61, 359.

Leptadenia reticulata W. & A.—Nanophanerophyte, in flower 28-10-61, 317.

Oxystelma esculentum R. Br.—Nanophanerophyte, in flower 26-11-61, 397.

Pergularia daemia (Forsk.) Chiov. (=*Pergularia extensa* N. E. Br.)—Nanophanerophyte, in flower 29-10-61, 330.

GENTIANACEAE

Nymphoides cristatum (Roxb.) O. Kuntze (=*Limnanthemum cristatum* Griseb.)—Hypdrophyte, in flower 31-10-61, 370.

EHRETIACEAE

Cordia dichotoma Forst. f. (=*C. obliqua* Willd.)—Nanophanerophyte, in flower 31-10-61, 361.

BORAGINACEAE

Heliotropium indicum Linn.—Therophyte, in flower 30-10-61, 354.

H. scabrum Retz.—Therophyte, in flower 1-11-61, 391.

CONVOLVULACEAE

Evolvulus alsinoides (Linn.) Linn.—Chamaephyte, in flower 29-10-61, 322.

Ipomcea pes-carpae (Linn.) Sweet—Hemicryptophyte, in flower 31-10-61, 364.

Rivea hypocrateriformis Choisy—Nanophanerophyte, in flower 28-10-61, 318.

SCROPHULARIACEAE

Limnophila indica (Linn.) Druce (*L. gratioloides* R. Br.)—Hydrophyte, in flower 31-10-61, 369.

PEDALIACEAE

Pedalium murex Linn.—Therophyte, in flower and fruit 31-10-61, 367.

ACANTHACEAE

Barleria cuspidata Heyne—Nanophanerophyte, in flower and fruit 27-11-61, 407.

Justicia prostrata (C. B. Cl.) Gamble—Chamaephyte, in flower and fruit 30-10-61, 343.

J. tranquebariensis Linn. f.—Nanophanerophyte, in flower and fruit 1-11-61, 386.

Lepidagathis pungens Nees—Nanophanerophyte, in flower and fruit 29-10-61, 332.

VERBENACEAE

Gmelina asiatica Linn.—Nanophanerophyte, in flower 28-10-61, 315.

Phyla nodiflora (Linn.) Greene (=*Lippia nodiflora* Mich.)—Helophyte, in flower 30-10-61, 344.

LABIATAE

Anisomeles malabarica R. Br.—Chamaephyte, in flower 30-10-61, 341.

Leucas aspera Spreng.—Therophyte, in flower 30-10-61, 353.

Ocimum adscendens Willd.—Chamaephyte, in flower 1-11-61, 382.

NYCTAGINACEAE

Boerhavia diffusa Linn.—Chamaephyte, in flower and fruit 29-10-61, 339.

AMARANTHACEAE

Aerva javanica (Burm. f.) Spreng. (=*A. tomentosa* Forsk.)—Chamaephyte, in flower 29-10-61, 333.

Allmania nodiflora R. Br.—Therophyte, in flower 2-11-61, 395.

Pupalia lappacea (Linn.) Juss. var. **velutina** Hk. f.—Chamaephyte, in flower 1-11-61, 380.

POLYGONACEAE

Polygonum glabrum Willd.—Hydrophyte, in flower 31-10-61, 363.

P. barbatum Linn.—Hydrophyte, in flower 1-11-61, 401.

LAURACEAE

Cassytha filiformis Linn.—Parasite, in flower 29-10-61, 335.

EUPHORBIACEAE

Croton bonplandianum Baill. (=*C. sparsiflorus* Morong)—Therophyte, in flower and fruit 30-10-61, 342.

Euphorbia thymifolia Linn.—Therophyte, in flower 30-10-61, 350.

Jatropha gossypifolia Linn.—Nanophanerophyte, in flower 29-10-61, 338.

Phyllanthus maderaspatensis Linn.—Therophyte, in flower and fruit 29-10-61, 325.

Securinega leucopyrus (Willd.) Muell.—Arg. (=*Fluggea leucopyrus* Willd.)—Nanophanerophyte, in flower 29-10-61, 319.

HYDROCHARITACEAE

Ottelia alisnoides Pers.—Hydrophyte, in flower 30-10-61, 358.

LILIACEAE

Iphigenia indica Kunth—Geophyte, in flower and fruit 1-11-61, 385.

Scilla indica Baker—Geophyte, in flower 2-11-61, 396.

PANDANACEAE.

Pandanus tectorius Soland.—Nanophanerophyte, in flower 29-11-61, 400.

CYPERACEAE

Cyperus arenarius Retz.—Geophyte, in flower and fruit 28-10-61, 310.

C. kyllingia Endl. (=*Kyllinga monocephala* Roxb.)—Helophyte, in flower and fruit 31-10-61, 373.

C. rotundus Linn.—Helophyte, in flower 28-11-61, 411.

Fimbristylis bis-umbellata Bub.—Helophyte, in flower and fruit 30-10-61, 376.

F. dipsacea Benth.—Helophyte, in flower and fruit 1-11-61, 377.

GRAMINEAE

Aristida setacea Retz.—Chamaephyte, in flower and fruit 28-11-61, 410.

Eragrostis gangetica (Roxb.) Steud.—Chamaephyte, in flower and fruit 27-11-61, 409.

E. poaeoides Beauv.—Chamaephyte, in flower and fruit 28-10-61, 312.

Lopholepis ornithocephala (Hk.) Steud.—Chamaephyte, in flower and fruit 31-10-61, 374.

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